



VMware - vSphere

INSTALL & CONFIGURE BEYOND

INTRODUCTION

V5

A complete course for all beginning and intermediate students with over 70% of all materials devoted to “Live Labs.” Students will complete the course with a comprehensive knowledge of ESXi Server, vCenter and Virtual Machine Architecture, as well as advanced management techniques. Students will:

Build their own ESXi Server

Build VM's

Create Virtual Machine Clones

Migrate a physical computer to a Virtual Machine

Use a wide variety of third-party tools

Install vCenter

Configure a cluster

Initiate VMotion

See High Availability in action

Secure their ESXi Server

Much, much more...



MODULE 1 – INTRODUCTION – WHY DO WE VIRTUALIZE?

- What is Virtualization
- A brief history of Virtualization
 - Virtualization
 - X86 Virtualization
 - Server Virtualization with VMware
- Why do we Virtualize
 - Save Money
 - Improve Agility
 - Implement Initiatives
- What's New in vSphere

MODULE 2 - TERMS AND CONCEPTS

- Host
- Virtual Machine
- Encapsulation & Portability
- P2V – Physical to Virtual
- Isolation
- Idealized Hardware
- Virtualization Layer
- Hypervisor (Virtual Machine Monitor)
- vmnic
- VMnet / vSwitch
- VMkernel
- Hardware-assisted Memory Virtualization
- VMware Paravirtualized SCSI (PVSCSI)
- VMFS – Virtual Machine File System
- Swap Space
- Root /
- Jumbo Frames
- Virtual Infrastructure Client
- Service Console
- Compliance
- Remediation



MODULE 3 - INSTALLING ESXI SERVER 5

- ESXi Server 5 hardware requirements
- VMFS File system Limits
- ESXi Server Maximums
- ESXi Server Disk Partitioning
- Keeping a Server Build Document
- ESXi install methods
- The ESXi 5 Installation Processⁱ
- Post-installation tasksⁱⁱ
- Troubleshootingⁱⁱⁱ

MODULE 4 - BUILDING AND CONFIGURING VIRTUAL MACHINES

- Virtual Machine Basics
- Virtual Machine Resources
- Installing the Virtual Infrastructure Client^{iv}
- Creating a Virtual Machine^v
- Select a Datastore^{vi}
- Choose a Guest Operating System^{vii}
- Virtual Machine Remote Console^{viii}
- Virtual Machine Files^{ix}
- Independent Disk Mode
- Virtual Machine Resource utilization
 - Shares and Reservations
 - Processor Affinity

MODULE 5 - VIRTUAL NETWORKING

- Virtual Switches
- Viewing Virtual Switches
- Virtual Switch Properties^x
- Physical Adapters
- Physical Adapter Properties
- Port Groups^{xi}
- Port Group Properties
- Security and Traffic Shaping
- MAC Addresses^{xii}
- Service Console Tools^{xiii}



MODULE 6 - PHYSICAL TO VIRTUAL MIGRATIONS (P2V)

- P2V Terminology
- Four Common P2V Methods
- Linux command line P2V
- Ghost with Bart's Preinstalled Environment
- VMware Converter^{xiv}
- Platespin Migrate

MODULE 7: SERVER CONSOLIDATION

- Server Consolidation and Virtualization Defined
- Adoption and Support of Server Virtualization
- Business Case and Technical Requirements
- Technology Strategy: Technology Refresh and Aging
- Infrastructure
- Cost Performance
- Service Agility
- Simplifying the Environment
- Compliance and Risk Reduction
- High-Level Requirements
- Classification and Estimated Work Hours
- The Financial Model
- Developing Your Project Methodology
- Establishing the Project
- Best Practices
- Addressing Typical Challenges
- Gathering Data and Application/Server Inventory
- Structured Interviews
- Application Inventory
- Process Documentation
- Application Repository
- Buy In and Collation
- Assessment
- Application Readiness
- Rationalization
- Technical Leadership to Provide Guidance and Structure
- Assessing Processes, Roles, and Responsibilities Technology Design
- Testing and Validating
- Capacity Planning



MODULE 8 - TOOLS FOR A VIRTUAL INFRASTRUCTURE

- Veeam Tools
 - Veeam Configurator^{xv}
 - Veeam Backup and Fast SCP^{xvi}
- Putty
- WinSCP
- Disk Images
 - Win ISO^{xvii}
 - Win Image^{xviii}
 - Adding Disk Images files to Virtual Machines^{xix}
- NewSID^{xx}
- Gparted
- Wireshark
- SysPrep
- Platespin
- Quest (Vizioncore)
- PDA and smart phone tools



MODULE 9 - INSTALLING AND SUPPORTING VCENTER

- vCenter enables Services
- vCenter Components
 - Virtual Infrastructure Client
 - vCenter Agent
 - vCenter Server
 - Virtual Infrastructure Web Access
 - vCenter Database
 - License Server
- vCenter Supported Databases
- vCenter Minimum Requirements
- vCenter Installation^{xxi}
- Logging in to vCenter^{xxii}
- Adding Datacenters and Hosts^{xxiii}
- vCenter Permissions and Roles
- vCenter Default Roles
- vCenter Custom Permissions^{xxiv}
- vCenter Customization Specification (Sysprep)^{xxv}
- Customization Specification Wizard
- vCenter Cloning
- vCenter Clone Wizard^{xxvi}
- vCenter Templates^{xxvii}
- vCenter Performance Charts
- vCenter Tasks & Events
- vCenter Alarms^{xxviii}
- vCenter Topology Maps
- vCenter Guided Consolidation
- vCenter Update Manager^{xxix}
- vCenter VMotion^{xxx}
 - VMotion Requirements
 - VCenter VMotion in Action
 - Storage VMotion^{xxxi}
- vCenter Clustering^{xxxii}
 - vCenter Cluster Requirements
 - vCenter Distributed Resource Scheduling (DRS) Cluster settings
 - vCenter High Availability (DAS) Cluster Settings
 - vCenter Distributed Power Management (DPM) Cluster Settings
 - vCenter Cluster Options
- vCenter Resource Pools^{xxxiii}



MODULE 10 - BEST PRACTICES

- ESXi Server Hardware Best Practices
- ESXi Server Software Best Practices
- Common Problems and “Gotcha’s”

MODULE 11 - BACKUP TECHNIQUES FOR A VIRTUAL INFRASTRUCTURE

- Backup Terms
- Backup Approaches
 - Backing up ESXi Servers
 - Backing up Virtual Machines
- VMware Consolidated Backup (Backup environment)
 - VCB Usage Models
 - VCB Requirements
 - VCB Workflow
- Install and use Veeam Backup^{xxxiv}

MODULE 12 - INSIDE ESXI, CRITICAL FILES AND FOLDERS

- Viewing the File system^{xxxv}
 - ESXi Server Configuration Files
 - ESXi Server Boot Process
 - Run levels
 - ESXi Server Services

MODULE 13 - USING THE CLI

- CLI Shortcuts^{xxxvi}
- Copy and Moving Files^{xxxvii}
- Finding Files and Searching^{xxxviii}
- Managing Users on ESXi^{xxxix}
- Directory and file Ownership
- Mounting and Unmounting
- Managing Processes
- Starting and Stopping Services
- VMware Commands
 - Working with VMFS^{xi}
 - Managing Virtual Machines^{xli}



LIST OF LIVE LABS

- ⁱ Student performs full installation of ESXi Server 5
- ⁱⁱ Student will examine and analyze the log files from his/her ESXi installation to validate installation
- ⁱⁱⁱ Student performs command-line operations to create VMware troubleshooting support file and enables remote console access
- ^{iv} Student downloads Virtual Infrastructure Client from his/her own ESXi Server and installs it on Windows
- ^v Student Begins the process of creating his/her first Virtual Machine
- ^{vi} Student configures and adds Datastore to ESXi Server
- ^{vii} Student's first VM is a Windows XP VM
- ^{viii} Each student opens a Virtual Machine Remote Console window
- ^{ix} Student installs WinSCP and examines the files created during VM build process
- ^x Student creates new isolated network on ESXi Server
- ^{xi} Student creates new VMkernel Connection Type for storage data traffic
- ^{xii} Student determines MAC of his/her own virtual machine, ESXi Server and other ESXi components then proves the correctness of these MAC addresses with both configuration files and Service Console commands
- ^{xiii} Student runs a series of Service Console troubleshooting commands which could be used to recover ESXi Server networking
- ^{xiv} Students install VMware Converter and use it to convert their Windows Workstation to a VM running on their own ESXi Server
- ^{xv} Students install and use Veeam Configurator to enable/disable root access
- ^{xvi} Students install and use Veeam Backup and FastSCP, including command-line firewall configurations
- ^{xvii} Students install and use WinISO to create an ISO file
- ^{xviii} Students install and use Winimage to create a diskette image
- ^{xix} Students learn how to use both Datastore ISO files and Client Device connections to add ISO's and diskette images to ESXi Server
- ^{xx} Students install and use NewSid to customize the identity of their P2V conversion
- ^{xxi} Each Student performs a full installation of vCenter on his/her local Windows workstation
- ^{xxii} Each student logs-in to vCenter using Windows credentials
- ^{xxiii} Each Student adds a datacenter and host to his/her own vCenter
- ^{xxiv} Each student creates a custom role specifying certain granular privileges then applies that role to a user, proving the ability of vCenter to control user access
- ^{xxv} Student obtains correct version of deploy.cab for Windows version and installs extracted files to appropriate folders in vCenter to enable Customization Specification
- ^{xxvi} Student creates a vCenter clone with customization
- ^{xxvii} Student creates a vCenter template, examines the contents of the template and explored utilization of templates
- ^{xxviii} Students create a custom alarm and prove its effectiveness
- ^{xxix} Each student creates a baseline (reference point) against which his/her ESXi Server can be compared, then explores the integrated patch management features of vCenter
- ^{xxx} In this lab, each student makes sure his/her ESXi Server is ready for VMotion by going through a checklist and taking care of missed/omitted steps. Students then have the opportunity to VMotion their VM's throughout the classroom datacenter at will, exploring the advantages and likely pitfalls of certain configuration settings.
- ^{xxxi} For Storage VMotion each student installs plug-ins and snap-ins to enhance vCenter's abilities, and migrates their VM's from one Datastore to another.
- ^{xxxii} Classroom exercise, the entire class works together to create a DRS and HA enabled cluster and explore all the options for creating clusters
- ^{xxxiii} Each student creates his/her own resource pool and moves VM's into that resource Pool



-
- ^{xxxiv} Students may install, configure and use Quest (Vizioncore) vRanger Pro
 - ^{xxxv} Students use WinSCP to explore critical configuration files on their ESXi Server
 - ^{xxxvi} Students learn how to navigate on the command line more effectively and with shortcuts
 - ^{xxxvii} Students explore copying, moving and renaming files
 - ^{xxxviii} Students learn how to search for files and strings within a file
 - ^{xxxix} In this lab students will learn how to add users, change passwords and “harden” ESXi Server security by not permitting direct root access to the ESXi Server.
 - ^{xl} Students will both create and extend Virtual Machine disk files from the command line
 - ^{xli} Students will manage Virtual Machines directly from the command line in the event that no instance of VCenter can be reached